SITE ASSESSMENT REPORT
FOR THE
RIVER BEND SITE
DETROIT, WAYNE COUNTY, MICHIGAN

Prepared for:

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
Region V
Emergency Response Branch
9311 Groh Road
Grosse Ile, MI 48138

Prepared by:

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U.S. EPA On-Scene Coordinator:	Tricia Edwards

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February 23, 2011

Prepared by: Matthew A. Beer Date 02/23/11
Matthew Beer
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Lori Kozel
WESTON START Project Manager

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LIST OF ABBREVIATIONS AND ACRONYMS

DEA	Department of Environmental Affairs
GPS	Global positioning system
MDNRE	Michigan Department of Natural Resources and Environment
NCP	National Oil and Hazardous Substances Pollution Contingency Plan
OSC	On-Scene Coordinator
ppm	Part per million
SA	Site assessment
START	Superfund Technical Assessment and Response Team
U.S. EPA	United States Environmental Protection Agency
VSP	Visual Sampling Plan
WESTON	Weston Solutions, Inc.
XRF	X-ray fluorescence

1. INTRODUCTION

Under Technical Direction Document No. S05-0001-1005-034, the United States Environmental Protection Agency (U.S. EPA) tasked the Weston Solutions, Inc., (WESTON®), Superfund Technical Assessment and Response Team (START) to assist the U.S. EPA On-Scene Coordinator (OSC) in performing a site assessment (SA) at the River Bend Site in Detroit, Wayne County, Michigan (the Site) (**Figure 1-1**). Specifically, U.S. EPA requested that WESTON START assess and collect x-ray fluorescence (XRF) readings from surficial soil; collect soil samples based on the XRF readings; collect photographic documentation; and evaluate the potential for imminent and substantial threats to human health, human welfare, and the environment posed by the Site. The SA was conducted on July 7, 2010, under the direction of OSC Tricia Edwards.

This SA report is organized into the following sections:

- **Introduction –** Provides a brief description of the objective and scope of SA activities;
- **Site Background –** Details the Site description and history;
- **Site Assessment Activities –** Discusses the Site reconnaissance, Site observations, and sampling activities during the SA;
- **XRF Results –** Discusses XRF results for samples collected during the SA; and
- **Conclusions –** Summarizes Site assessment findings.

Figures and tables are presented after the conclusions section. In addition, this SA report contains one appendix, Appendix A, which provides photographic documentation of Site conditions during the SA.

2. SITE BACKGROUND

This section discusses the Site description and history.

2.1 SITE DESCRIPTION

The Site is located at the intersection of East Jefferson Avenue and Newport Street. The Site's

approximate geographical coordinates are 42º 22’ 16” North latitude and 82º 56’ 50” West longitude. **Figure 1-1** shows the Site location. The Site currently consists of an open grassy lot with no buildings or structures and is approximately 12 acres in size. The Site is approximately 1.2 miles north from the Detroit River.

The Site property is bordered to the north by East Jefferson Avenue and commercial and residential properties, to the south by Freud Street and residential properties, to the east by Newport Street and residential properties, and to the west by Piper Boulevard and a commercial property. Eastlawn Street runs through the Site. The Site has no perimeter fencing or obstructions to deter people or wildlife from entering the property, and a school is located 0.2 miles southwest of the Site.

2.2 SITE HISTORY

Historical aerial images show that three structures have been demolished from the Site since 1999. Two residential houses were located on Eastlawn Street, at the south end of the Site, and removed between March 1999 and July 2001. Additionally, a commercial building was once located at the northwest corner of the Site. The building was removed between October 2004 and March 2005, and its parking lot was later removed between August 2009 and early May 2010.

In May 2010, the City of Detroit Department of Environmental Affairs (DEA) requested assistance from the U.S. EPA Region 5 Emergency Response Branch in performing a SA to evaluate potential threats to human health and the environment posed by the Site.

On May 25, 2010, U.S. EPA, WESTON START, and the City of Detroit conducted a windshield survey of the Site property and observed the current status of the Site before conducting the SA. The Site was observed to consist of a vacant parcel with vegetation and no buildings. Two outdoor electrical transformers were observed at the Site as well as city sewers located throughout the Site. The Site had no perimeter fencing or obstructions to deter people or wildlife from entering the property.

3. SITE ASSESSMENT ACTIVITIES

The SA was conducted to evaluate potential threats to human health and the environment posed by metals at the Site and to evaluate the need for further response actions. The following sections discuss the Site reconnaissance, Site observations, and sampling activities conducted during the SA.

3.1 SITE RECONNAISSANCE

On July 7, 2010, U.S. EPA OSC Tricia Edwards and WESTON START members Matthew Beer and Lori Kozel mobilized to the Site. Mr. Robert Brown with the City of Detroit DEA was also present at the Site during the SA. After a brief safety meeting and equipment setup, U.S. EPA and WESTON START personnel began locating the predetermined screening locations identified by the Visual Sampling Plan (VSP) software using a global positioning system (GPS) and flagged each location for screening. **Figure 3-1** shows the screening locations, which are discussed in more detail in Section 3.3 below. During the Site reconnaissance, WESTON START also collected written and photographic documentation of current Site conditions. **Appendix A** provides a photographic log of Site conditions at the time of the Site reconnaissance.

3.2 SITE OBSERVATIONS

At the time of the SA discussed in this report, the Site was a vacant parcel with vegetation and no buildings. Two outdoor electrical transformers were observed at the Site as well as city sewers located throughout the Site. The Site had no perimeter fencing or obstructions to deter people or wildlife from entering the property. No hazards were identified during SA activities.

3.3 XRF SCREENING ACTIVITIES

During the SA, WESTON START performed XRF screening for selected metals of surface soil throughout the Site using an Innov-X XRF analyzer. **Figure 3-1** shows the screening locations. WESTON START used the sampling design generated for the Site by the VSP software to

identify the XRF screening and potential sampling locations. The VSP software identified 67 screening locations to locate a hotspot with a 50-foot-radius with a 95 percent probability. Locations RIV-64 through RIV-67 were eliminated from the screening because of concrete covering the entire area of these screening locations. Therefore, 63 locations were screened using the XRF analyzer. The VSP software provided coordinates for each location, and a grid was evenly distributed across the Site. The XRF analyzer was used to screen the surface soil at each pre-determined location. Where required, surface vegetation was removed to create a flat surface to collect accurate XRF readings.

Based on Site observations and XRF results for 63 locations, the OSC directed WESTON START to collect no soil samples from the Site.

4. XRF RESULTS

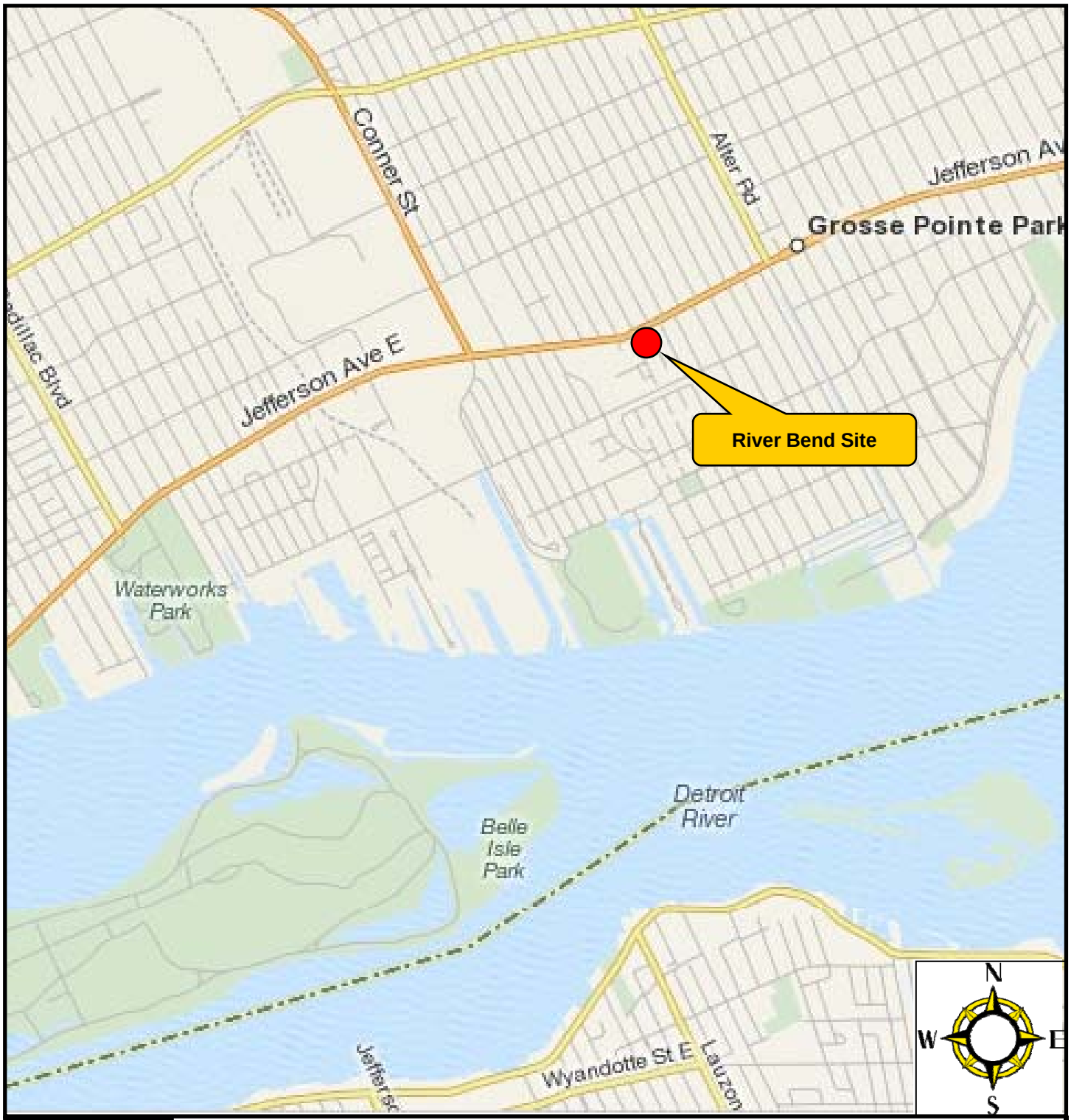
Table 4-1 summarizes the XRF results for the 63 XRF screening locations, and **Figure 4-1** summarizes the XRF lead screening results. The XRF analyzer provides results for 21 metals and typically is used for lead assessments. Historical data evaluations support the correlation between actual sample data from the laboratory and XRF field screening results. For this SA, WESTON START focused on the lead and arsenic concentrations in surficial soils. Both lead and arsenic contamination typically are of concern in industrial areas in the City of Detroit.

The XRF lead screening results ranged from 14 to 703 parts per million (ppm), with the highest result detected at RIV-36. According to the Michigan Department of Natural Resources and Environment (MDNRE) Part 201 - Residential and Commercial I Direct Contact Criteria, a total lead value in soil exceeding 400 ppm and a total arsenic value exceeding 7.6 ppm present a direct contact risk. XRF screening results for (2) two locations exceeded the lead value of 400 ppm (RIV-7 and RIV-36) and (2) two locations exceeded the arsenic value of 7.6 ppm (RIV-7 and RIV-11). The XRF results also were compared to the State of Michigan Default Background levels, and cadmium, copper, iron, manganese, nickel, silver, and zinc results exceeded the background levels but were below the MDNRE Part 201 Residential and Commercial I Direct Contact Criteria.

5. CONCLUSIONS

Based on the XRF readings, three locations exceeded the MDNRE Part 201 - Residential and Commercial I Direct Contact Criteria for either lead or arsenic or both. The XRF results also were compared to the State of Michigan Default Background levels, and cadmium, copper, iron, lead, manganese, nickel, silver, and zinc results exceeded the background levels but were below the MDNRE Part 201 Residential and Commercial I Direct Contact Criteria. The XRF readings were below hazardous levels, and the screening locations were covered with vegetation at the time of sampling. The focus of this SA was surface soil and potential metals contamination only. A thorough historical review of the Site was not conducted, and other contaminants and deeper subsurface conditions were not assessed.

FIGURES



= Callout for Site Address

= Location of the River Bend Site, Intersection of East Jefferson Avenue and Newport Street

Figure 1-1

Prepared for:
U.S. EPA. REGION V
Contract No: EP-S5-06-04

TDD No.: S05-0001-1005-034
DCN: 1067-2H-AHLB

Prepared by:
WESTON SOLUTIONS, INC.
7800 W. Outer Drive, Suite 200
Detroit, MI 48235

SITE LOCATION MAP
River Bend Site, Intersection of E. Jefferson Ave & Newport St.
Detroit, Wayne County, MI
June 22, 2010 Scale: Not to Scale

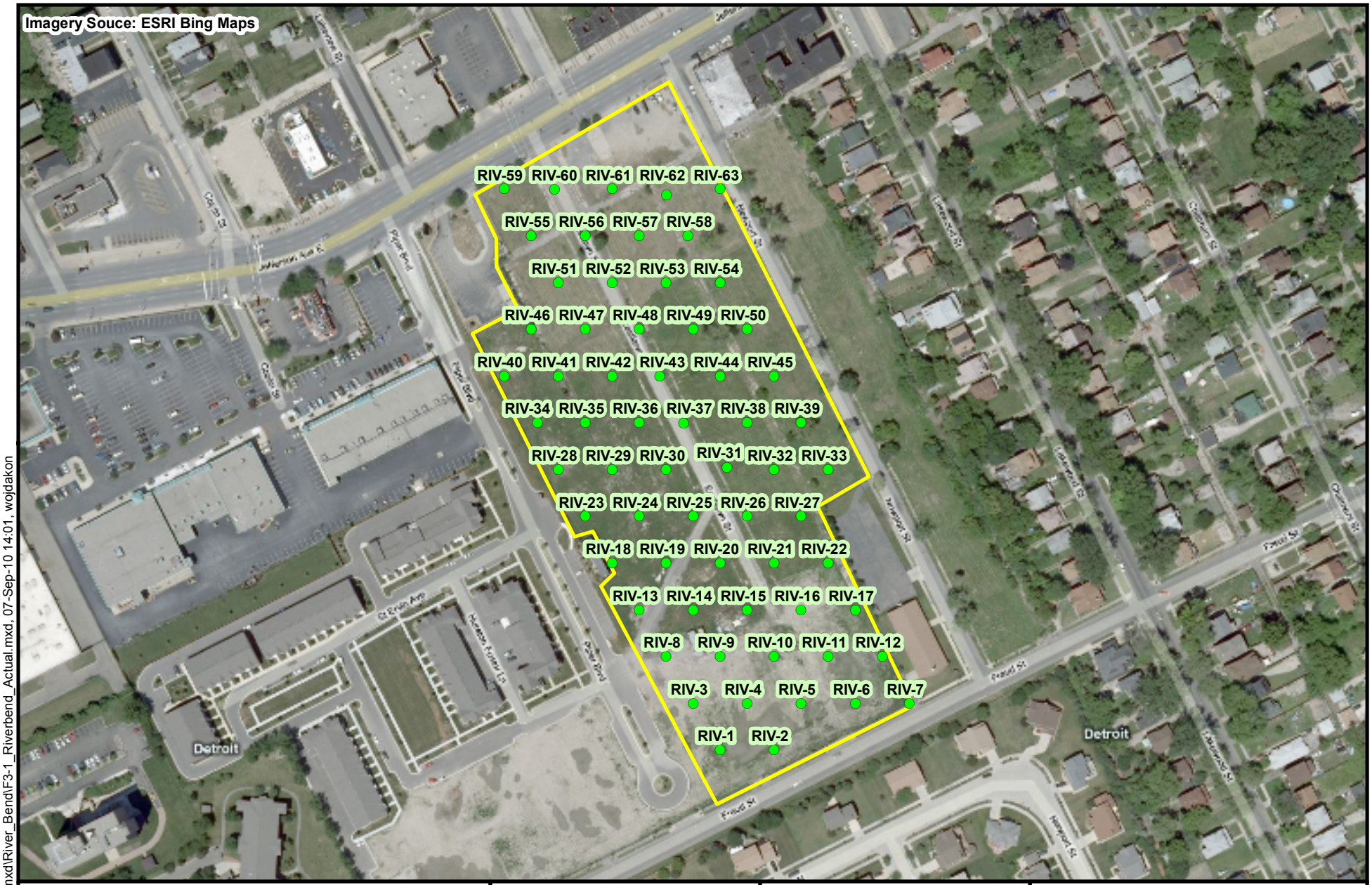


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Figure 3-1
Sampling Location Map
River Bend SA
Detroit, Wayne County, Michigan

File: D:\Detroit_XRF\mxd\River_Bend\F3-1_Riverbend_Actual.mxd, 07-Sep-10 14:01, wojdakon

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Figure 4-1
XRF Lead Results
River Bend SA
Detroit, Wayne County, Michigan

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TABLES

Table 4-1
XRF Results – Metals Sample Summary
River Bend Site Assessment
Detroit, Wayne County, Michigan

Chemical Name	State Default Background (ppm)	Field Sample ID	RIV-1	RIV-2	RIV-3	RIV-4	RIV-5	RIV-6	RIV-7
		Sampling Date	7/8/2010	7/8/2010	7/8/2010	7/8/2010	7/8/2010	7/8/2010	7/8/2010
		Regulatory Limit Soil[a] (ppm)	Result (ppm)						
Antimony	NA	180	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD
Arsenic	5.8	7.6	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD	**55**
Barium	75	37,000	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD
Cadmium	1.2	550	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD
Chromium	NA	NA	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD
Cobalt	6.8	2,600	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD
Copper	32	20,000	< LOD	25	29	< LOD	25	< LOD	358
Iron	12,000	160,000	11,683	12,229	11,599	10,584	13,607	17,002	43,059
Lead	21	400	*52*	40	56	68	71	57	**454**
Manganese	440	25,000	86	645	119	< LOD	139	< LOD	< LOD
Mercury	0.13	160	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD
Molybdenum	NA	2,600	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD
Nickel	20	40,000	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD
Rubidium	NA	NA	54	53	44	51	54	54	66
Selenium	0.41	2,600	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD
Silver	1	2,500	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD
Strontium	NA	330,000	118	148	123	122	133	107	180
Tin	NA	NA	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD
Titanium	NA	NA	1,150	1,345	2,607	1,818	2,892	2,016	4,392
Zinc	47	170,000	95	135	109	98	97	125	326
Zirconium	NA	NA	157	120	123	127	136	134	161

Table 4-1
XRF Results – Metals Sample Summary
River Bend Site Assessment
Detroit, Wayne County, Michigan

Chemical Name	State Default Background (ppm)	Field Sample ID	RIV-8	RIV-9	RIV-10	RIV-11	RIV-12	RIV-13	RIV-14
		Sampling Date	7/8/2010	7/8/2010	7/8/2010	7/8/2010	7/8/2010	7/8/2010	7/8/2010
		Regulatory Limit Soil[a] (ppm)	Result (ppm)						
Antimony	NA	180	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD
Arsenic	5.8	7.6	< LOD	< LOD	< LOD	**12**	< LOD	< LOD	< LOD
Barium	75	37,000	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD
Cadmium	1.2	550	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD
Chromium	NA	NA	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD
Cobalt	6.8	2,600	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD
Copper	32	20,000	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD	37
Iron	12,000	160,000	12,407	7,689	16,785	14,003	11,048	13,446	16,801
Lead	21	400	37	16	35	39	60	158	99
Manganese	440	25,000	1,097	138	< LOD	115	< LOD	< LOD	207
Mercury	0.13	160	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD
Molybdenum	NA	2,600	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD
Nickel	20	40,000	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD
Rubidium	NA	NA	34	42	67	55	56	49	46
Selenium	0.41	2,600	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD
Silver	1	2,500	72	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD
Strontium	NA	330,000	228	144	105	115	116	131	138
Tin	NA	NA	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD
Titanium	NA	NA	3,308	2,184	2,913	2,509	1,990	2,784	3,196
Zinc	47	170,000	80	42	87	56	62	258	218
Zirconium	NA	NA	110	192	156	206	138	148	136

Table 4-1
XRF Results – Metals Sample Summary
River Bend Site Assessment
Detroit, Wayne County, Michigan

Chemical Name	State Default Background (ppm)	Field Sample ID	RIV-15	RIV-16	RIV-17	RIV-18	RIV-19	RIV-20	RIV-21
		Sampling Date	7/8/2010	7/8/2010	7/8/2010	7/8/2010	7/8/2010	7/8/2010	7/8/2010
		Regulatory Limit Soil[a] (ppm)	Result (ppm)						
Antimony	NA	180	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD
Arsenic	5.8	7.6	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD
Barium	75	37,000	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD
Cadmium	1.2	550	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD
Chromium	NA	NA	< LOD	< LOD	< LOD	< LOD	287	< LOD	< LOD
Cobalt	6.8	2,600	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD
Copper	32	20,000	< LOD	27	< LOD	< LOD	57	< LOD	< LOD
Iron	12,000	160,000	21,207	13,619	11,746	15,002	26,624	20,261	7,116
Lead	21	400	107	45	100	68	116	42	117
Manganese	440	25,000	137	< LOD	< LOD	109	728	159	< LOD
Mercury	0.13	160	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD
Molybdenum	NA	2,600	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD
Nickel	20	40,000	< LOD	< LOD	< LOD	< LOD	114	< LOD	< LOD
Rubidium	NA	NA	55	53	48	48	54	66	37
Selenium	0.41	2,600	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD
Silver	1	2,500	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD
Strontium	NA	330,000	135	126	128	140	128	111	94
Tin	NA	NA	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD
Titanium	NA	NA	3,142	2,723	2,706	3,025	2,206	2,355	1,311
Zinc	47	170,000	167	69	145	126	1,474	111	102
Zirconium	NA	NA	149	169	159	123	146	149	113

Table 4-1
XRF Results – Metals Sample Summary
River Bend Site Assessment
Detroit, Wayne County, Michigan

Chemical Name	State Default Background (ppm)	Field Sample ID	RIV-22	RIV-23	RIV-24	RIV-25	RIV-26	RIV-27	RIV-28
		Sampling Date	7/8/2010	7/8/2010	7/8/2010	7/8/2010	7/8/2010	7/8/2010	7/8/2010
		Regulatory Limit Soil[a] (ppm)	Result (ppm)						
Antimony	NA	180	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD
Arsenic	5.8	7.6	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD
Barium	75	37,000	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD
Cadmium	1.2	550	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD
Chromium	NA	NA	< LOD	< LOD	< LOD	< LOD	< LOD	162	< LOD
Cobalt	6.8	2,600	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD
Copper	32	20,000	28	< LOD	< LOD	< LOD	19	< LOD	31
Iron	12,000	160,000	15,215	14,365	14,673	13,774	6,713	15,447	16,060
Lead	21	400	81	45	45	100	118	59	164
Manganese	440	25,000	271	< LOD	109	< LOD	68	132	< LOD
Mercury	0.13	160	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD
Molybdenum	NA	2,600	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD
Nickel	20	40,000	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD
Rubidium	NA	NA	49	49	51	53	29	57	62
Selenium	0.41	2,600	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD
Silver	1	2,500	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD
Strontium	NA	330,000	148	98	127	112	84	138	134
Tin	NA	NA	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD
Titanium	NA	NA	3,004	2,536	2,057	2,575	1,130	3,060	3,652
Zinc	47	170,000	136	123	250	140	85	96	174
Zirconium	NA	NA	131	137	145	137	120	177	162

Table 4-1
XRF Results – Metals Sample Summary
River Bend Site Assessment
Detroit, Wayne County, Michigan

Chemical Name	State Default Background (ppm)	Field Sample ID	RIV-29	RIV-30	RIV-31	RIV-32	RIV-33	RIV-34	RIV-35
		Sampling Date	7/8/2010	7/8/2010	7/8/2010	7/8/2010	7/8/2010	7/8/2010	7/8/2010
		Regulatory Limit Soil[a] (ppm)	Result (ppm)						
Antimony	NA	180	< LOD	< LOD	< LOD	< LOD	< LOD	94	< LOD
Arsenic	5.8	7.6	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD
Barium	75	37,000	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD
Cadmium	1.2	550	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD
Chromium	NA	NA	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD
Cobalt	6.8	2,600	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD
Copper	32	20,000	< LOD	< LOD	24	< LOD	< LOD	82	25
Iron	12,000	160,000	14,678	12,244	10,989	11,881	11,805	10,222	13,176
Lead	21	400	37	74	132	154	119	132	75
Manganese	440	25,000	< LOD	93	126	< LOD	< LOD	< LOD	< LOD
Mercury	0.13	160	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD
Molybdenum	NA	2,600	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD
Nickel	20	40,000	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD
Rubidium	NA	NA	48	53	44	53	46	44	54
Selenium	0.41	2,600	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD
Silver	1	2,500	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD
Strontium	NA	330,000	140	130	113	127	90	103	174
Tin	NA	NA	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD
Titanium	NA	NA	2,520	2,309	2,009	2,393	2,100	< LOD	2,489
Zinc	47	170,000	87	269	152	380	124	205	94
Zirconium	NA	NA	168	190	117	148	161	140	150

Table 4-1
XRF Results – Metals Sample Summary
River Bend Site Assessment
Detroit, Wayne County, Michigan

Chemical Name	State Default Background (ppm)	Field Sample ID	RIV-36	RIV-37	RIV-38	RIV-39	RIV-40	RIV-41	RIV-42
		Sampling Date	7/8/2010	7/8/2010	7/8/2010	7/8/2010	7/8/2010	7/8/2010	7/8/2010
		Regulatory Limit Soil[a] (ppm)	Result (ppm)						
Antimony	NA	180	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD
Arsenic	5.8	7.6	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD
Barium	75	37,000	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD
Cadmium	1.2	550	< LOD	< LOD	51	60	< LOD	< LOD	< LOD
Chromium	NA	NA	< LOD	< LOD	120	< LOD	< LOD	< LOD	< LOD
Cobalt	6.8	2,600	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD
Copper	32	20,000	< LOD	24	< LOD	< LOD	< LOD	< LOD	< LOD
Iron	12,000	160,000	17,659	14,460	14,254	11,783	12,170	10,485	17,152
Lead	21	400	**703**	221	60	39	75	74	71
Manganese	440	25,000	140	< LOD	120	120	< LOD	< LOD	< LOD
Mercury	0.13	160	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD
Molybdenum	NA	2,600	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD
Nickel	20	40,000	< LOD	57	< LOD	< LOD	< LOD	< LOD	< LOD
Rubidium	NA	NA	56	57	55	51	49	41	54
Selenium	0.41	2,600	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD
Silver	1	2,500	< LOD	51	< LOD	< LOD	< LOD	< LOD	< LOD
Strontium	NA	330,000	109	163	100	91	127	107	102
Tin	NA	NA	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD
Titanium	NA	NA	3,198	2,832	2,542	2,181	1,512	1,763	2,999
Zinc	47	170,000	192	171	76	62	130	101	84
Zirconium	NA	NA	154	205	132	119	155	106	131

Table 4-1
XRF Results – Metals Sample Summary
River Bend Site Assessment
Detroit, Wayne County, Michigan

Chemical Name	State Default Background (ppm)	Field Sample ID	RIV-43	RIV-44	RIV-45	RIV-46	RIV-47	RIV-48	RIV-49
		Sampling Date	7/8/2010	7/8/2010	7/8/2010	7/8/2010	7/8/2010	7/8/2010	7/8/2010
		Regulatory Limit Soil[a] (ppm)	Result (ppm)						
Antimony	NA	180	77	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD
Arsenic	5.8	7.6	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD
Barium	75	37,000	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD
Cadmium	1.2	550	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD
Chromium	NA	NA	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD
Cobalt	6.8	2,600	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD
Copper	32	20,000	35	23	< LOD	< LOD	< LOD	< LOD	< LOD
Iron	12,000	160,000	13,109	11,426	7,439	10,982	13,999	10,526	11,870
Lead	21	400	167	253	202	26	85	181	172
Manganese	440	25,000	132	< LOD	< LOD	< LOD	< LOD	117	< LOD
Mercury	0.13	160	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD
Molybdenum	NA	2,600	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD
Nickel	20	40,000	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD
Rubidium	NA	NA	47	47	39	49	49	38	41
Selenium	0.41	2,600	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD
Silver	1	2,500	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD
Strontium	NA	330,000	128	110	102	327	101	115	123
Tin	NA	NA	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD
Titanium	NA	NA	2,546	2,253	1,929	3,312	3,126	1,301	2,277
Zinc	47	170,000	170	264	257	39	118	160	235
Zirconium	NA	NA	120	111	123	165	169	129	114

Table 4-1
XRF Results – Metals Sample Summary
River Bend Site Assessment
Detroit, Wayne County, Michigan

Chemical Name	State Default Background (ppm)	Field Sample ID	RIV-50	RIV-51	RIV-52	RIV-53	RIV-54	RIV-55	RIV-56
		Sampling Date	7/8/2010	7/8/2010	7/8/2010	7/8/2010	7/8/2010	7/8/2010	7/8/2010
		Regulatory Limit Soil[a] (ppm)	Result (ppm)						
Antimony	NA	180	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD
Arsenic	5.8	7.6	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD
Barium	75	37,000	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD
Cadmium	1.2	550	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD
Chromium	NA	NA	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD
Cobalt	6.8	2,600	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD
Copper	32	20,000	< LOD	< LOD	< LOD	< LOD	54	29	26
Iron	12,000	160,000	8,438	14,027	16,733	12,828	13,300	12,617	10,944
Lead	21	400	129	75	49	130	257	130	200
Manganese	440	25,000	< LOD	< LOD	238	< LOD	< LOD	< LOD	108
Mercury	0.13	160	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD
Molybdenum	NA	2,600	< LOD	< LOD	< LOD	< LOD	< LOD	9	< LOD
Nickel	20	40,000	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD
Rubidium	NA	NA	42	50	31	44	50	43	46
Selenium	0.41	2,600	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD
Silver	1	2,500	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD
Strontium	NA	330,000	117	114	169	107	129	113	135
Tin	NA	NA	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD
Titanium	NA	NA	1,896	2,632	3,175	1,308	3,033	1,568	1,964
Zinc	47	170,000	295	120	150	191	320	176	150
Zirconium	NA	NA	165	134	66	122	148	128	145

Table 4-1
XRF Results – Metals Sample Summary
River Bend Site Assessment
Detroit, Wayne County, Michigan

Chemical Name	State Default Background (ppm)	Field Sample ID	RIV-57	RIV-58	RIV-59	RIV-60	RIV-61	RIV-62	RIV-63
		Sampling Date	7/8/2010	7/8/2010	7/8/2010	7/8/2010	7/8/2010	7/8/2010	7/8/2010
		Regulatory Limit Soil[a] (ppm)	Result (ppm)						
Antimony	NA	180	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD
Arsenic	5.8	7.6	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD
Barium	75	37,000	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD
Cadmium	1.2	550	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD
Chromium	NA	NA	< LOD	151	< LOD	< LOD	< LOD	< LOD	< LOD
Cobalt	6.8	2,600	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD
Copper	32	20,000	< LOD	< LOD	< LOD	< LOD	< LOD	29	< LOD
Iron	12,000	160,000	9.926	16,011	7,886	12,919	16,015	14,152	11,913
Lead	21	400	14	246	143	113	81	225	108
Manganese	440	25,000	116	< LOD	< LOD	111	221	< LOD	< LOD
Mercury	0.13	160	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD
Molybdenum	NA	2,600	< LOD	< LOD	10	< LOD	< LOD	< LOD	< LOD
Nickel	20	40,000	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD
Rubidium	NA	NA	38	54	41	40	46	47	39
Selenium	0.41	2,600	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD
Silver	1	2,500	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD
Strontium	NA	330,000	140	121	146	133	125	127	103
Tin	NA	NA	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD
Titanium	NA	NA	1933	2,982	< LOD	2,009	2,290	2,806	2,486
Zinc	47	170,000	47	371	145	147	87	210	107
Zirconium	NA	NA	89	153	257	120	113	128	102

Notes:

Result exceeds State Default Background level

Bold result exceeds MDNRE Part 201 - Direct Contact Residential and Commercial I Soil Criteria

ID = Identification

LOD = Level of detection

MDNRE = Michigan Department of Natural Resources and Environment

NA = Not available

ppm = Part per million

a Based on MDNRE Part 201 - Direct Contact Residential and Commercial I Soil Criteria

APPENDIX A
PHOTOGRAPHIC DOCUMENTATION

Site: River Bend Site
Photograph No.: 1 **Date:** 7/7/10
Direction: North **Photographer:** M. Beer
Subject: Site located at the southwest corner of Eastlawn Street and East Jefferson Avenue

Site: River Bend Site
Photograph No.: 2 **Date:** 7/7/10
Direction: West **Photographer:** M. Beer
Subject: View of Site to the West

Site: River Bend Site
Photograph No.: 3 **Date:** 7/7/10
Direction: Southwest **Photographer:** M. Beer
Subject: View of Site to the southwest

Site: River Bend Site
Photograph No.: 4 **Date:** 7/7/10
Direction: South **Photographer:** M. Beer
Subject: View of Site to the south

Site: River Bend Site
Photograph No.: 5 **Date:** 7/7/10
Direction: East **Photographer:** M. Beer
Subject: View of Site to the East

Site: River Bend Site
Photograph No.: 6 **Date:** 7/7/10
Direction: Down **Photographer:** M. Beer
Subject: XRF screening of surface soils